

Strategies for Managing the Patient on Insulin

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Objectives

- To identify the need for all health providers to play an active role in the education of the individual with diabetes
- To identify challenges that interfere with diabetes self care
- To share methods of interacting with the individual who is starting insulin therapy
- To discuss strategies that help the individual be successful in giving injections

Cost Set to Explode with Diabetes Epidemic

- According to the ADA
 - 26 million people have diabetes
 - 54 million people have pre-diabetes
 - In Idaho 90,000 had diabetes in 2010
- According to the CDC
 - Diabetes cost in 2012 was \$245 billion
 - 1 in 3 Medicare dollars was spend on PWD
 - ER visits cost \$11.3 million in 2008
 - 1 in 3 people will have diabetes by 2050

Who is currently certified?

- As of January 2013 – just over 17,800 CDEs:
- RN (including CNS/NP): 53% - 9,454
- RD: 39% - 6,942
- RPh (including PharmD): 5% - 949
- Remainder of CDEs made up of health care professionals in variety of areas, including, but not limited to, MD/DO, PA, LP, Adv Deg Social Workers, RCEP[®]/CES[®]/Adv Deg Exercise Physiologists: 3% - 504



Differences in the Three Major Types of Diabetes

		Type 1	Type 1.5/LADA	Type 2
	Avg. age at start	12	35	60
	Typical age at start	3-40*	20-70*	35-80*
	% of all diabetes	10% (25%**)	15%	75%
	Insulin problem	Absence	Deficiency	Resistance
	Antibodies	ICA, IA2, GAD65, IAA Zinc transporter antibody	Mostly GAD65	None
	Early treatment	Insulin is vital, diet & exercise changes helpful	Pills or insulin vital, diet & exercise changes helpful	Pills helpful, diet & increased activity essential
	Late treatment	Insulin, diet, exercise (occasionally pills)	Insulin, pills, diet exercise	Insulin, pills, diet, exercise

*May occur at any age

**If all antibody positive cases are included, i.e. Type 1 and Type 1.5

Blood

Glucose Levels in Diabetes

Blood Sugar Level	No Diabetes	Pre Diabetes	Diabetes
Fasting Blood Sugar	< 100	100-125	>125 (twice)
Random or 2 hour GTT	<140	140-200	>200

Newsflash!

“Borderline Diabetes is a Myth!”

Challenges That Interfere with Diabetes Self-Care When Insulin Is Needed

- Lack of comprehensive diabetes Knowledge
- Afraid of needles
- Too time consuming
- Physical limitations/poor manual dexterity
- Fear of pain
- Fear of hypoglycemia
- Vision/hearing impairment
- Memory impairment

Action Times for Insulins

Insulin:	Starts in:	Peaks at:	Ends after:	Lows likely at:
Apidra	10-20 min.	1.5-2.5 hrs.	4-5 hrs.	2-5 hrs.
Humalog	10-20 min.	1.5-2.5 hrs.	4-5 hrs.	2-5 hrs.
Novolog	10-20 min.	1.5-2.5 hrs.	4-5 hrs.	2-5 hrs.
Detemir	1 hr.	5 hrs.	18-24 hrs.	8-18 hrs.
Lantus	1-2 hrs	6 hrs.	18-26 hrs.	5-10 hrs.

Target Blood Sugar Range

	<u>American Diabetes Association</u>	<u>American Academy Clinical Endocrinologists</u>
Fasting Blood Sugar (FBS)	90-130	<110
1-2 hours after meal	<180	<140
A1c	<7	<6.5

*Diabetes Care, Volume 31, Jan. 2008
Endocrine Practice, Supplement 1, pg 8 2002*


Suggestions to Reassure the Patient Starting on Insulin

- Insulin helps to lower the risk of getting complications.
- Taking insulin doesn't mean the patient failed. The body just needs extra help.
- Ask if doing finger sticks for BG monitoring. Tell them insulin hurts less than a finger stick.
- Show them the size of a needle used for insulin injection at beginning of insulin discussion.

Injections: What the Patient Needs to Know


- Where to inject
- How to inject
 - Correct technique with pen or vial
- Name and type of insulin and when it works
- How much to take
- When to take
- Recordkeeping –BG, insulin dose, food intake

Factors That Affect Insulin Absorption



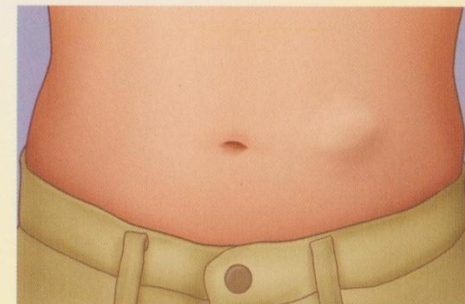
*These **speed up** absorption*

- Injecting into stomach or arms
- Injecting into an exercised arm or leg
- Applying heat
- Taking smaller doses of insulin
- Massaging the area of injection



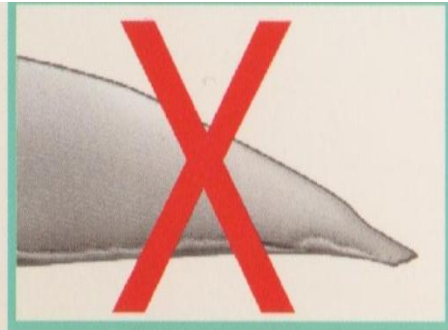
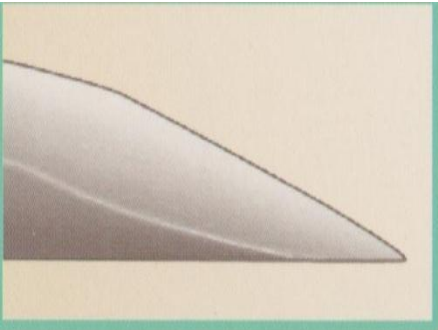
*These **slow down** absorption*

- Injecting NPH or Regular insulin into thighs or buttocks
- Injecting into scarred or lumpy tissue
- Applying a cold compress
- Taking larger doses of insulin
- Smoking

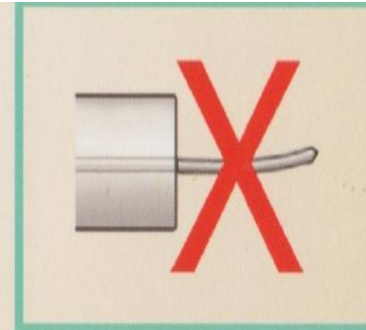
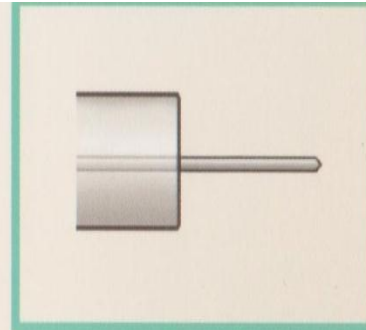


Factors Causing Injections to Hurt

- Using alcohol to clean injection site
- Injecting cold insulin
- Re-using needles or using a bent needle
- Tensing up before injection
- Injecting into muscle



Re-used needle tip may become worn



Re-used needle tip may bend

Injection Site Difficulties

- Injections can lead to skin problems at the injection site
 - Bruising
 - Lipoatrophy – Pitting of the skin
 - Hypertrophy – Build up of fat

Changes in Insulin Administration Practices

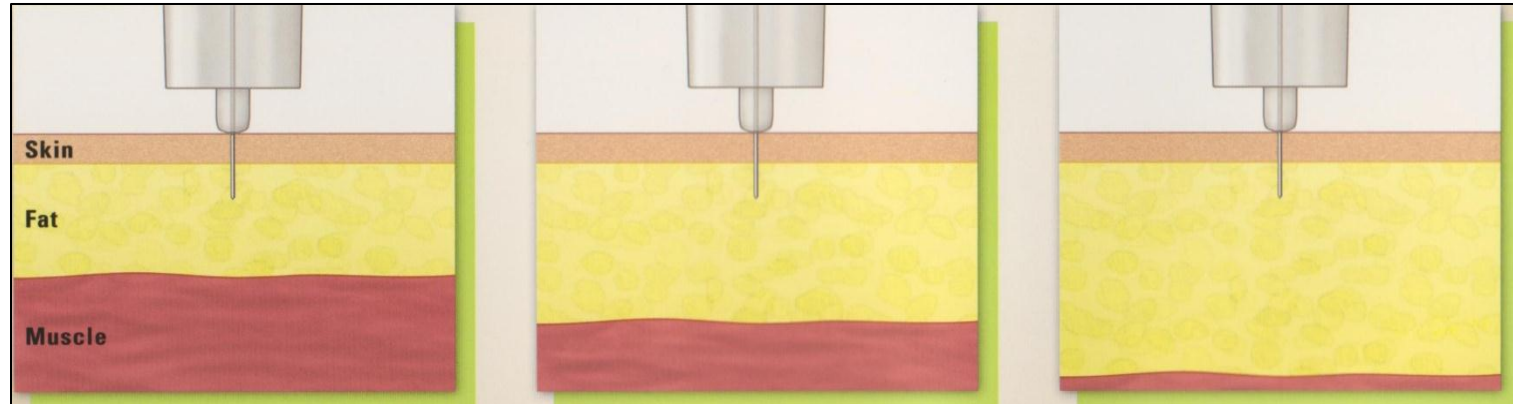
- **Insulin bottle or pen in use does not need refrigeration**
- **Insulin pens being used more often**
- **Needle length shorter (2/8"-1/2")**
- **Gauge smaller (29-33 gauge)**
- **Pens hold 300 units vs. vial holds 1000 units. Child/elderly more likely to use 300 units before expiration date occurs than with a vial**

American Diabetes Association, Insulin Administration, Diabetes Care, 2004; 27:5106-5109

Variations in Use of Pen vs. Syringe

- ▶ **Pen needs primed with 1-2 units to expel air from tip of needle**
- ▶ **Inject and hold needle under skin for 10 seconds to guarantee correct dose given**
- ▶ **Remove needle and apply pressure to injection site (do not massage) for 10 seconds (prevents leakage and bruising)**

Needles



- ▶ Shorter length and smaller gauge more comfortable
- ▶ 1/2" and 5/16" pinch up skin
- ▶ 3/16" and nano needles, no pinch needed

Pattern Management

- Basal Insulin (Background)
 - Mimics slow steady release of insulin by pancreas
 - Give 1to 2 times daily
 - Examples: Lantus, Levemir, NPH
- Bolus Insulin (Mealtime)
 - Rapid acting insulin given to cover for food
 - Give 5-30 minutes before or immediately after meal
 - Examples: Novolog, Humalog, Apidra, Humulin R, Novolin R
- Combination Pre-Mixed Insulin
 - Basal and bolus insulin combined
 - Frequently used for elderly with consistent daily routine
 - Less injections, less costly

Monitoring Suggestions

- Background Insulin (Lantus/Levemir)
 - Check fasting. If A1c elevated with good FBS, check 2 hours post meal to evaluate.
- Intermediate (NPH)
 - Check FBS and ac supper or HS
- Mealtime Insulin (Humalog, Novolog, Apidra)
 - Check 4 times daily. If can't afford, ask how many times can afford to check.
 - Once daily – Rotate fasting, ac lunch, ac supper and HS
 - Twice daily – fasting and ac supper one day, ac lunch and HS next day.
- Recordkeeping
 - Any time outside the target range note in log what was happening that day such as stress, exercise, ill, menstrual cycle

Hypoglycemia Signs/Symptoms

- Cold sweat, clammy
- Extreme hunger
- Shakiness
- Dizziness
- Lightheadedness
- Anxiety
- Sweating
- Weakness
- Yawning
- Blurred vision

- Irritability
- Slurred speech
- Headache
- Rapid heartbeat
- Mood changes
- Inability to concentrate

- Seizures
- Unconsciousness
- Death

Mild
↓ **50-70**

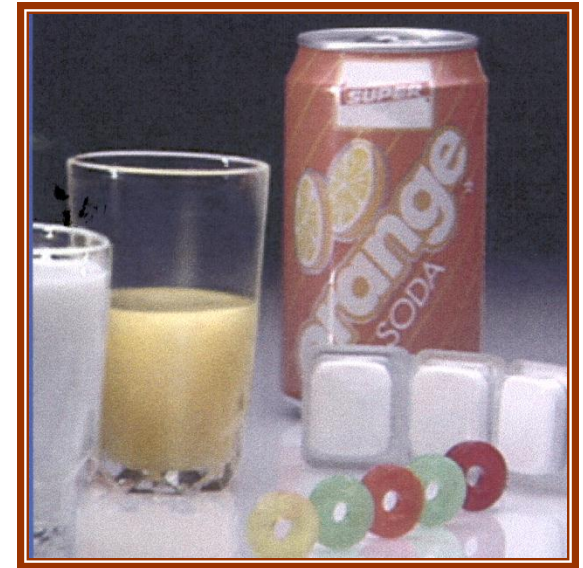
Moderate
↓ **35-50**

Severe
↓ **35**

Treating Hypoglycemia

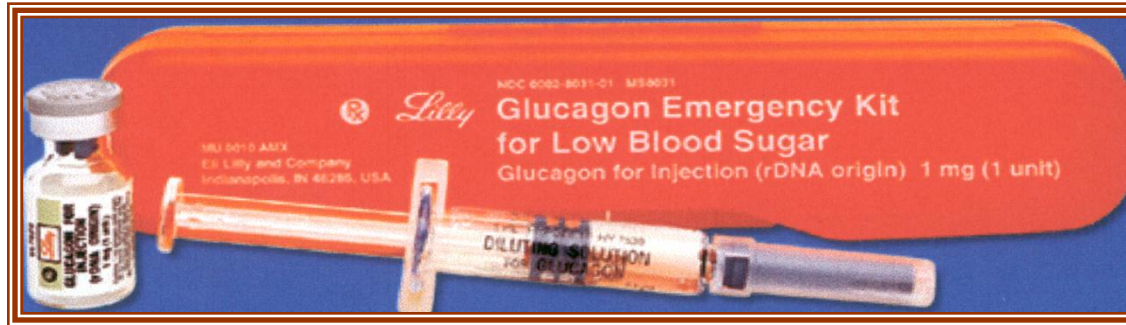
Rule of 15

- If possible, test blood sugar
- Eat or drink a carbohydrate food (15 grams)
- Rest for 15 minutes, then retest blood sugar
- If blood sugar remains too low, repeat steps 2 and 3
- Eat a meal or protein and carbohydrate snack within the next hour



Glucagon for Hypoglycemia

-If On Insulin-

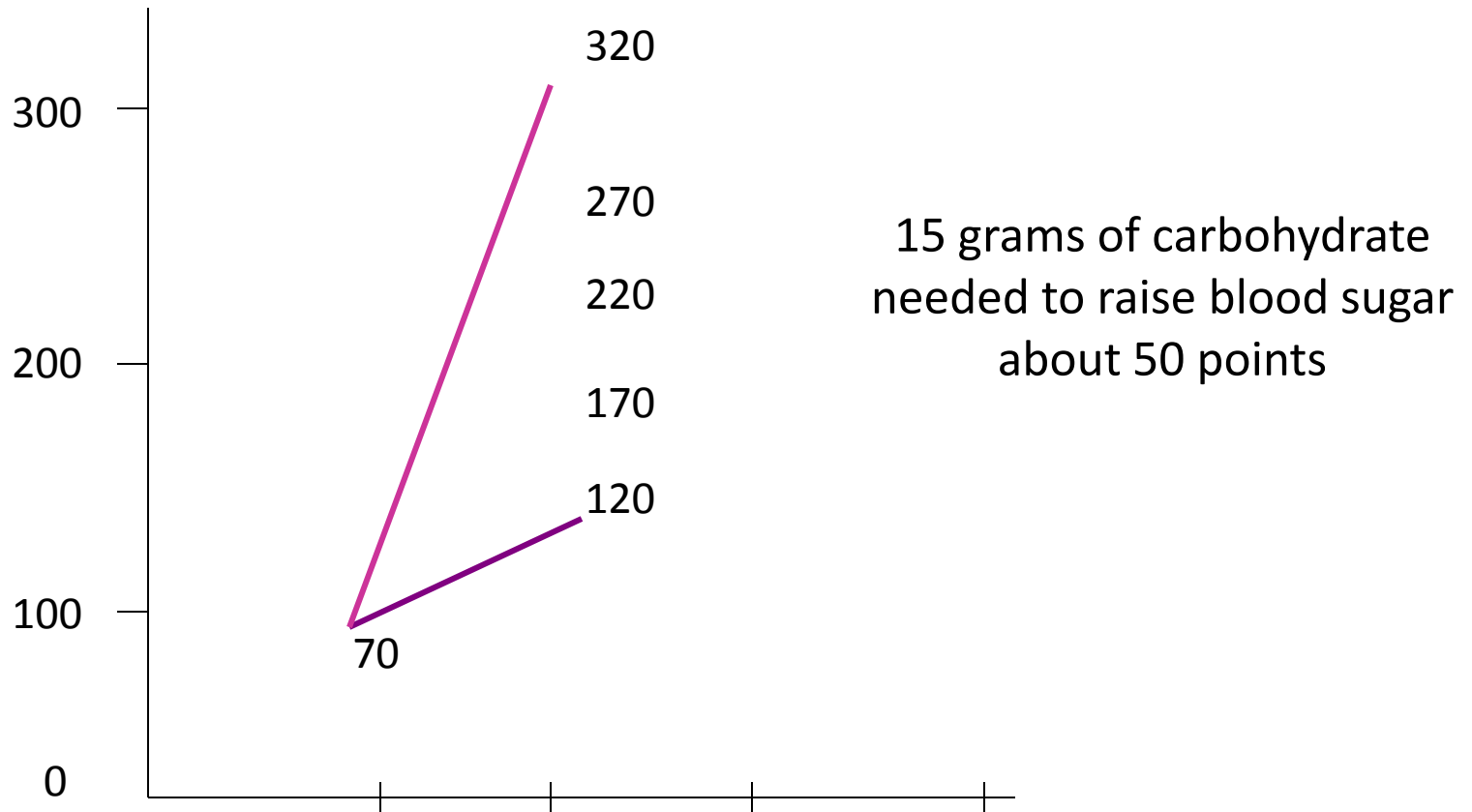


Used when a person with diabetes has lost consciousness due to hypoglycemia

Causes liver to release stored glucose

A family member or caregiver must learn how and when to give glucagon

Too Much Carbohydrate For a Low Contributes to Rebound Hyperglycemia



Hypoglycemia Unawareness

Triggers:

- Frequent low blood sugar
- A rapid drop in the blood sugar
- Having diabetes for many years
- Stress or depression
- Situations where self-care is low priority
- Alcohol consumption in the last 12 hours
- Use of certain medications like beta blockers (metoprolol, propranolol, atenolol)

Follow Up Visits

- Review log book
- Have patient circle highs and square lows
- Look for patterns
 - Random occasional high or low, no pattern
 - Highs or lows same time of day
 - One bad day
- Unexplained highs or lows
 - Record reason in log

Daily Diabetes Self-Management Log

HDC

©

Name: FULANO

HUMPHREYS
DIABETES CENTER

Directions: Bring a completed log to every appointment/class to assist you in better understanding diabetes

	Blood Sugar	Breakfast		Blood Sugar	Blood Sugar	Lunch		Blood Sugar	Blood Sugar	Dinner		Blood Sugar	Bedtime	
Day/Date	Before	Medication	Food	After	Before	Medication	Food	After	Before	Medication	Food	After	Blood Sugar	Medication
6/15	122				71				186				123	

Comments/Activities/Snacks

Day/Date	Before	Medication	Food	After	Before	Medication	Food	After	Before	Medication	Food	After	Blood Sugar	Medication
6/16	101				62				163				98	

Comments/Activities/Snacks

Day/Date	Before	Medication	Food	After	Before	Medication	Food	After	Before	Medication	Food	After	Blood Sugar	Medication
6/17	104				76				142				143	

Comments/Activities/Snacks

Day/Date	Before	Medication	Food	After	Before	Medication	Food	After	Before	Medication	Food	After	Blood Sugar	Medication
6/18	92				69				165				89	

Comments/Activities/Snacks

Day/Date	Before	Medication	Food	After	Before	Medication	Food	After	Before	Medication	Food	After	Blood Sugar	Medication
6/19	143				80				201				108	

Comments/Activities/Snacks

Day/Date	Before	Medication	Food	After	Before	Medication	Food	After	Before	Medication	Food	After	Blood Sugar	Medication
6/20	89				82				192				117	

Comments/Activities/Snacks

Day/Date	Before	Medication	Food	After	Before	Medication	Food	After	Before	Medication	Food	After	Blood Sugar	Medication
6/21	84				66				135				121	26

Comments/Activities/Snacks

Daily Diabetes Self-Management Log



©

HUMPHREYS
DIABETES CENTER

Name: _____

Directions: Bring a completed log to every appointment/class to assist you in better understanding diabetes

	Blood Sugar	Breakfast			Blood Sugar	Blood Sugar	Lunch			Blood Sugar	Blood Sugar	Dinner			Blood Sugar	Bedtime	
Day/Date	Before	Medication	Food	After	Before	Medication	Food	After	Before	Medication	Food	After	Before	Medication	After	Blood Sugar	Medication
6/7/06	189				120				101							142	
Comments/Activities/Snacks																	
6/8/06	191				111				83							126	
Comments/Activities/Snacks																	
6/9/06	203				92				79							93	
Comments/Activities/Snacks																	
6/10/06	198																
Comments/Activities/Snacks																	
6/11/06	226																
Comments/Activities/Snacks																	
6/11/06	221				87				130							103	
Comments/Activities/Snacks																	
6/12/06	169				103				119							122	
Comments/Activities/Snacks																	
6/13/06	178				116				152							131	27
Comments/Activities/Snacks																	

Summary

- Involve the individual in self care as much as possible.
- Observe ability of person to perform or assist with daily self care routines.
- Understand the myriad of factors that contribute to daily variations in diabetes control and appropriate steps to correct imbalances.
- Consider factors and strategies that will affect your ability to successfully start your patients on insulin.

